

## CLAIMS

1. A method for operating a measuring sensor having a radiation source and a spectrographic sensor comprising:

5           operating said radiation source to generate a first light signal having a first spectral power distribution;

          measuring said first light signal with said spectrographic sensor;

          generating standardization parameters based on a ratio of light sensed around a wavelength of interest and a reference wavelength;

10          operating said radiation source to generate a second light signal having a second spectral power distribution; and

          measuring said second light signal with said spectrographic sensor;

          generating calibration parameters based on a ratio of light sensed around said wavelength of interest and said reference wavelength.

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2. A method for operating a measuring sensor as claimed in claim 1 further comprising selecting said first light signal and said second light signal to control resolution of said calibration parameters.

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3. A method for operating a measuring sensor as claimed in claim 2 wherein operating said radiation source comprises applying a voltage to a lamp, and selecting said first light signal and said second light signal comprises controlling the voltage level applied to said lamp so that a first voltage level defines said first light signal and a second voltage level defines said second light signal wherein the greater the separation between said first and second voltage levels the greater

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the resolution of said calibration parameters.

4. A method for calibrating a measuring sensor having a radiation source and a spectrographic sensor comprising:

          controlling said radiation source to generate a standardization light signal;

standardizing said spectrographic sensor based on measurements of said standardization light signal taken by said spectrographic sensor;

controlling said radiation source to generate a calibration light signal; and

calibrating said standardized spectrographic sensor based on measurements of said

5 calibration light signal taken by said spectrographic sensor.

5. A method for calibrating a measuring sensor as claimed in claim 4 wherein standardizing said spectrographic sensor comprises generating standardization parameters based on a ratio of said measurements of said standardization light signal made around a wavelength of interest and  
10 around a reference wavelength.

6. A method for calibrating a measuring sensor as claimed in claim 5 wherein calibrating said standardized spectrographic sensor comprises generating calibration parameters based on a ratio of said measurements of said calibration light signal made around said wavelength of interest and  
15 around said reference wavelength.

7. A method for simulating a reference sample in a measuring sensor having a radiation source and a spectrographic sensor comprising:

varying the intensity of said radiation source to at least two intensity levels;

20 measuring radiation emitted from said radiation source with said spectrographic sensor at said at least two intensity levels;

standardizing said measuring sensor based on measurements made at a first one of said at least two intensity levels of said radiation source; and

25 calibrating said measuring sensor based on measurements at a second one of said at least two intensity levels of said radiation source.

8. A method for simulating a reference sample as claimed in claim 7 wherein standardizing said measuring sensor comprises generating standardization parameters based on a ratio of said measurements made at a first one of said at least two intensity levels around a wavelength of  
30 interest and around a reference wavelength.

9. A method for simulating a reference sample as claimed in claim 8 wherein calibrating said measuring sensor comprises generating calibration parameters based on a ratio of said measurements made at a second one of said at least two intensity levels around said wavelength  
5 of interest and around said reference wavelength.

10. A simulated reference sample for a measuring sensor, said sample comprising:

a radiation source;

a variable power supply for driving said radiation source, said radiation source generating

10 a first radiation having a first spectral power distribution when a first voltage is supplied to said radiation source and a second radiation having a second spectral power distribution when a second voltage is supplied to said radiation source;

a spectrographic sensor generating first signals representative of a wavelength of interest and a reference wavelength in response to said first radiation and second signals representative of  
15 said wavelength of interest and said reference wavelength in response to said second radiation;  
and

a system processor for determining a first function from the ratio of said signals representative of said wavelength of interest and said signals representative of said reference wavelength in response to said first radiation, said first ratio function being used to standardize  
20 said measuring sensor, and for determining a second function from the ratio of said signals representative of said wavelength of interest and said signals representative of said reference wavelength in response to said second radiation, said second ratio function being used to calibrate said measuring sensor.

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